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ABSTRACT

Few meaningful sex differences will be reported if investigators go beyond the reporting of statistical significance to determine the indices of experimental effect size. Techniques for obtaining this type of information include the calculation of d and the estimate of omega squared, which indicate the advisability of continuing a line of investigation. The data gathered on 303 women and 198 men resulted in conventional estimates for significance, but when omega-squared scores were calculated, only about four percent of the variance in scores on several measures of interests, attitudes, values and personality could be assigned to the sex variable alone. This information may be of value in the interpretation of counseling instruments as well as theory building about sex-role development. (BN)

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WOMEN AND MEN: ARE THEY MEANINGFULLY DIFFERENT IN VOCATIONAL INTERESTS? [1]

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The book, The Psychology of Sex Differences, published by Maccoby and Jacklin (1974) should do much to dispel certain myths about human sex differences. In their extensive review of research, Maccoby and Jacklin found, for example, no significant sex differences in"sociability," "suggestibility," self-esteem, or analytic cognitive style. More recently, Eagly (1978), in a thorough review of research investigations on "influenceability," has concluded that when "all available evidence is considered, the widely-accepted idea that there is a sex difference in influenceability consistent across types of influence settings appears to be wrong" (p. 105).

In Block's (1976) review of the Maccoby and Jacklin book, she suggested, among other things, that they should have used a "confidence interval" strategy in organizing and interpreting their material rather than a strategy of statistical significance or non-significance. Much the same suggestion is made here for Eagly's review on influenceability. Indeed, had Maccoby and Jacklin, and Eagly, done so, we predict that few meaningful sex differences would have been reported.

The essence of the Block suggestion is the urging of investigators to go beyond the reporting of statistical significance and to determine something about what writers (e.g., Cohen, 1969; Hays, 1963) describe as indices of experimental effect size. Techniques for obtaining this type of information include calculation of d (Cohen, 1969) and the estimate of omega squared (Hays, 1963). These are interrelated techniques which give an investigator some information about the advisability of continuing a line of investigation. This urging is particularly important in sex differences research wherein typically large samples are studied, and small mean differences prove to be statistically significant at or beyond con-

ventionally accepted levels of probability.

A number of sex group comparisons for various measures of attitudes, personality, and values (e.g., the California Psychological Inventory, the Allport-Vernon-Lindzey Study of Values, the Rokeach Dogmatism Scale, and the Attitudes Toward Women Scale) have been reported (Plant & Southern, 1977; Plant, Southern, & Jacklin, 1977; Potts & Plant, 1975; Talovic, 1978). These reports are o t ratios and accompanying estimate omega squared (w^2) values for statistically significant t ratios. In the main, we have not been impressed with the average magnitude of the w^2 value; that is, not much enhanced prediction of the attitude, personality, or values scores is obtained by knowing a subject's sex. Indeed, in two investigations (Garman & Plant, 1975; Potts & Plant, 1975) we have concluded that knowing the subject's verbal ability level provides a better prediction of attitude and personality test score than does knowing the sex of subject.

What we want to report now are similar studies of sex differences obtained from the Basic Interest Scales (BIS) of the Strong-Campbell Interest Inventory (SCII) (Campbell, 1974). The report is for the BIS standardization samples of 300 each men and women with the data for 23 BIS from Campbell's (1974) complete reporting in the SCII Manual. The same calculations have been obtained from women and men students enrolled in sections of upper and lower division psychology classes at our institution. The calculations reported are women vs. men t ratios and w^2 values, with the focus on the est. w^2 values for statistically significant t ratios. Perhaps it would be helpful to remind you that the est. w^2 gives an indication of the proportion of variance in the dependent variable (BIS score, in this instance) accounted for by the independent variable (here,

sex). It has been suggested (Cohen, 1969) that est. w^2 values of .10 or less offer little in the way of predictive ability.

The BIS T scores are based upon the raw scores of the standardization sample of 600 men and women. The mean and standard deviation for these Scales are 50 and 10, respectively. It was found by Campbell (1974) that women and men differed quite consistently in their mean T scores on these 23 Scales and so, on the protocol, scores are profiled by sex of subject.

The two samples for which BIS T scores are reported here, (a) 133 female and 88 male lower division students and (b) 170 female and 110 male upper division students, reflected similar differences. Differences are consistent in direction across the samples. Of concern here, however, is the magnitude, or effect size, of these differences. Attention is directed to the data displayed in Table 1, particularly to the entries in the last two columns.

As can be seen, t ratios were calculated for the 69 sex comparisons over the three samples. Of these, 49 t ratios were statistically significant at or beyond .05. Following Block's line of reasoning, est. w^2 values were then computed for significant t ratios. Est. w^2 ranged from .01-.35 (the Domestic Arts Scale for Campbell's norm group), with a median value of .04.

Viewed from a slightly different perspective, an est. w^2 value of .04 reflects a d value of approximately .4, or less than one-half of one standard deviation.

Both Hays (1963) and Cohen (1969) have described the salient properties of these measures of magnitude or effect size as being to reflect that proportion of variance in Y, the depencent variable, which can be

accounted for by X, the independent variable. Thus, with the present study, as well as with earlier related data on sex differences, only about 4% of the variance in scores on several measures of interests, attitudes, values, and personality can be assigned to the sex variable alone--hardly an impressive estimate. Replication of these analyses have recently been completed with data from two university counseling centers (Smith, 1978), and results will be reported later.

In summary, we suggest that in the area of sex differences, knowing the sex of the subject predicts very little about that subject's score on the measures so far studied for various samples. Note that for the data reported here, only four scales--Adventure, Mechanical Activities, Domestic Arts, and Art--reflect mean est. w^2 values of .10 or greater. The relatively low est. w^2 values obtained suggest that the variance obtained on sex-normed, or sex-interpreted, measures must be explained in terms other than gender or sex-role training alone.

This is not the conclusion to be logically drawn with results interpreted solely in terms of significance-nonsignificance. We urge, then, the small additional step of examining data relating to sex differences for effect size, or predictive ability. Such information should prove to be of value in interpreting the results of measurement instruments, particularly as they are used in counseling, and in theory-building about sex-role development.

References

Block, J. H. Debatable conclusions about sex differences. Contemporary Psychology, 1976, 21, 517-522.

Campbell, D. P. Strong Vocational Interest Blank: Manual for the Strong-Campbell Interest Inventory T325 (Merged Form). Stanford, Ca.: Stanford University Press, 1974.

Cohen, J. Statistical power analysis for the behavioral sciences. N.Y.: Academic Press, 1969.

Eagly, A. H. Sex differences in influenceability. Psychological Bulletin, 1978, 85, 86-116.

Hays, W. Statistics for psychologists. New York: Holt, Rinehart, & Winston, Inc., 1963.

Maccoby, E. E., & Jacklin, C. N. The psychology of sex differences. Stanford, A.: Stanford University Press, 1974.

Plant, W. T., & Southern, M. L. Meaningfulness of sex differences in selected interest-values test scores. Paper presented at the meeting of the American Psychological Association, San Francisco, August, 1977.

Plant, W. T., Southern, M. L., & Jacklin, C. N. Statistically significant sex differences in attitude, interest, and personality measures: Much ado about very little! Symposium presented at the meeting of the Western Association for Women Psychologists, San Jose, February, 1977.

Potts, C. J., & Plant, W. T. Conventional sex differences in personality: Does sex or ability level account for the variance? Paper presented at the meetings of the Western Psychological Association, Sacramento, April, 1975.

Smith, B. R. Sex differences on the SCII Basic Interest Scales: Substantive or just statistical? Unpublished master's thesis, San Jose State University, 1978.

Talovic, S. A. Does verbal ability or sex better predict interest test personality scores? Unpublished bachelor's honors thesis, San Jose State University, 1978.

TABLE 1

Female vs. Male Differences in Strong-Campbell Interest Inventory Basic Interest Scale Scores: Standardization Samples and Samples of Students Enrolled in Lower and Upper Division Psychology Classes

SCII BIS Variable	Data Source[a]	Females N	Females $\bar{X}$	Females σ	Males N	Males $\bar{X}$	Males σ	t	ω^2
Agriculture	1	300	48.59	9.98	300	51.41	9.98	- 3.46**	.02
	2	133	50.61	9.65	88	51.30	9.29	- .53	
	3	170	48.43	9.99	110	50.96	8.89	- 2.15*	.01
Nature	1	300	51.63	9.28	300	48.37	10.64	4.00**	.02
	2	133	53.04	10.38	88	50.97	9.44	1.50	
	3	170	53.31	8.96	110	50.78	12.07	2.02*	.01
Adventure	1	300	46.06	10.19	300	53.94	9.78	- 9.67**	.13
	2	133	49.24	10.33	88	56.05	9.62	- 4.93**	.10
	3	170	49.24	10.56	110	56.74	8.50	- 6.25**	.12
Military Activities	1	300	47.32	8.10	300	52.68	11.56	- 6.58**	.07
	2	133	46.29	8.78	88	47.97	10.12	- 1.30	
	3	170	45.45	7.30	110	47.93	9.78	- 2.42*	.02
Mechanical Activities	1	300	45.46	10.20	300	54.54	9.76	-11.17**	.17
	2	133	43.89	8.41	88	50.28	9.65	- 5.22**	.11
	3	170	44.54	9.04	110	51.26	8.90	- 6.12**	.12
Science	1	300	48.38	10.27	300	51.62	9.69	- 4.00**	.02
	2	133	47.12	8.36	88	50.51	9.09	- 2.85**	.03
	3	170	48.29	9.70	110	51.91	8.73	- 2.30*	.02
Mathematics	1	300	48.27	10.14	300	51.73	9.83	- 4.25**	.03
	2	133	43.72	8.99	88	47.48	9.58	- 2.96**	.03
	3	170	47.41	10.78	110	48.31	10.21	- .69	
Medical Science	1	300	49.94	10.39	300	50.06	9.56	- .15	
	2	133	51.81	9.91	88	53.09	8.71	.98	
	3	170	52.69	10.61	110	54.28	10.08	- 1.25	
Medical Service	1	300	52.61	11.44	300	47.39	8.28	6.44**	.06
	2	133	54.22	10.07	88	51.19	7.91	2.37*	.02
	3	170	49.68	9.72	110	51.80	9.06	- 1.83	

SCII BIS Variable	Data Source[a]	Females N	Females $\bar{X}$	Females σ	Males N	Males $\bar{X}$	Males σ	t	ω^2
Music/ Drama	1	300	54.03	9.67	300	45.97	10.29	9.89**	.14
	2	133	56.02	9.95	88	53.09	8.92	2.23*	.02
	3	170	57.43	9.14	110	52.85	9.22	4.08**	.05
Art	1	300	54.59	9.31	300	45.41	10.61	11.26**	.17
	2	133	55.53	8.99	88	50.28	9.52	4.15**	.07
	3	170	56.64	8.58	110	51.96	9.34	4.30**	.06
Writing	1	300	52.49	9.36	300	47.51	10.57	6.11**	.06
	2	133	53.11	7.86	88	50.00	9.34	2.67**	.03
	3	170	55.44	8.60	110	52.84	8.79	2.44*	.02
Teaching	1	300	51.90	9.03	300	48.10	10.85	4.67**	.03
	2	133	53.14	9.59	88	55.33	7.95	- 1.77	
	3	170	52.24	10.65	110	55.64	8.11	- 2.85**	.02
Social Services	1	300	52.50	9.30	300	47.50	10.70	6.11**	.06
	2	133	56.97	7.96	88	55.99	8.12	.89	
	3	170	55.53	8.66	110	55.10	8.46	.41	
Athletics	1	300	47.09	9.56	300	52.91	10.39	- 7.14**	.08
	2	133	49.91	9.59	88	54.41	9.85	- 3.38**	.04
	3	170	46.94	9.43	110	52.16	10.46	- 4.33**	.06
Domestic Arts	1	300	57.30	10.40	300	42.70	9.55	17.94**	.35
	2	133	56.88	9.60	88	47.60	9.23	7.14**	.18
	3	170	54.17	10.05	110	46.94	9.77	5.94**	.11
Religious Activities	1	300	51.49	9.66	300	48.51	10.30	3.66**	.02
	2	133	49.04	10.16	88	47.19	10.33	1.32	
	3	170	46.44	10.33	110	45.66	11.05	.60	
Public Speaking	1	300	47.99	9.98	300	52.01	9.99	4.93**	.04
	2	133	49.38	8.45	88	51.83	7.89	2.17*	.02
	3	170	51.83	8.65	110	52.74	9.25	- .84	
Law/ Politics	1	300	47.51	10.30	300	52.49	9.66	- 6.11**	.06
	2	133	48.90	8.82	88	51.76	8.76	- 2.37*	.02
	3	170	52.23	8.77	110	53.13	9.21	- .82	

SCII BIS Variable	Data Source[a]	Females N	Females $\bar{X}$	Females σ	Males N	Males $\bar{X}$	Males σ	t	ω^2
Merchandising	1	300	49.74	9.37	300	50.26	10.56	- .64	
	2	133	49.41	9.29	88	47.40	8.75	1.62	
	3	170	50.03	9.47	110	46.08	9.22	3.44**	.04
Sales	1	300	47.30	8.40	300	52.70	11.40	- 6.61**	.07
	2	133	46.59	7.74	88	48.39	8.40	- 1.64	
	3	170	46.21	7.78	110	46.84	8.28	- .65	
Business Management	1	300	48.05	9.40	300	51.95	10.53	- 4.79**	.04
	2	133	46.39	8.61	88	48.75	8.96	- 1.96*	.01
	3	170	49.29	9.55	110	47.73	9.50	1.34	
Office Practices	1	300	52.89	10.82	300	47.11	9.07	7.09**	.08
	2	133	49.32	9.30	88	44.89	7.73	3.71**	.05
	3	170	47.62	9.62	110	43.87	6.70	3.57**	.04

[a] Source 1: SCII, BIS standardization samples
Source 2: Students in sections of a lower division psychology class
Source 3: Students in sections of an upper division psychology class

** $p < .01$
* $p < .05$